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Input on new estimates of combined heat and power (CHP) technical and market potential to support greenhouse gas (GHG) reduction goals

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Lead Commissioner Workshop on Combined Heat and Power in California

The California Energy Commission Lead Commissioner on the Integrated Energy Policy Report (IEPR) will conduct a workshop to obtain comments and receive input on new estimates of combined heat and power (CHP) technical and market potential to support greenhouse gas (GHG) reduction goals proposed in the California Air Resources Board (ARB) AB 32 Climate Change Scoping Plan, motivations and barriers to distributed CHP development, and the implications of the Qualifying Facility Settlement Agreement on existing and future CHP systems.

The potential for combined heat and power is likely under-represented as currently presented in the ICF Study Commissioned by the CEC considering several issues not presented sufficiently in the study including –

- Uncertainty and under-reporting of estimates for CHP in mixed use districts
- Additional potential from promotion of combined heat and power by state agencies, local governments, utilities, and
- The need for new business models for ownership and operation of CHP.

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The technical and economic potential for reuse of waste energy from local on -site power production in urban higher density central plants has been recognized as an untapped opportunity. In the past, occasional studies were conducted to determine "district heating /cooling potential". These older studies recognized the benefits of amassing mixture of the end users but grappled with the question of the ownership of the power plant / heat recovery component. It is not clear how or if the ICF study used this assumption about adjoining urban properties.

The ICF summary reports an "Evaluation of markets with good electric load factor and thermal loads to utilize thermal energy from CHP system" including

- "Large and medium commercial institutional –education, health care, hotels, health clubs, prisons
- Use of thermal for air conditioning –commercial and institutional markets above plus retail, office buildings, and large multifamily complexes".

In addition to the Dun and Bradstreet database, which was the basis for this inventory of potential, the study should examine the plans of municipalities for urban infill,

development and master planning where economical/beneficial waste heat recovery is deployed.

Among topics for examination in Preparation of the 2012 Integrated Energy policy Report (2012 IEPR) is ensuring the inclusion of identification and examination of adjacent properties and potential match of their energy needs.

How would the future potential forecasts of CHP be modified if local government, state and utility regulations encouraging mixed use CHP were accounted for? To what extent has end use patterns assumed ownership by building type and by CHP system owner/operator? How have the study presenters taken consideration of the infrastructure for mixed-use building districts and how are these energy patterns accounted for in estimating future potential?

It is likely that the "untapped potential" of harnessing waste energy between neighboring properties equipped with on-site efficient power plants, both existing and proposed, is under reported because of the challenging organizational and ownership barriers. Assumptions for utility ownership of small-scale urban power plant models rate-based over a long term with strong engineering, operations and maintenance strengths would make for a strong scenario for future market penetration.

The ICF study, very comprehensive and broad, appears to have not been tasked to drill to a level of analysis taking into account neither this grain nor barriers. But without recognizing these long enduring factors, it would appear that the CEC might significantly underestimate the potential for CHP.

Over the years, utility investment in the planning and operation of urban scale central CHP has not come to fruition. Part of it appears to be challenges of the utility "going over" into the customer side. The business model for utility investment on the customer side for CHP is poorly understood – both the nature of institutional barriers and regulatory resistance should be researched in order to estimate the potential of CHP.

The factors for this resistance should be subject of research for better estimates of combined heat and power (CHP) technical and market potential to support greenhouse gas (GHG) reduction goals proposed in AB 32 Climate Change Scoping Plan.

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